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EtherHub-16mi+
Advanced Reference Guide

EH1502S
E0398-R01
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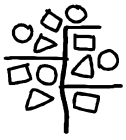
Advanced Reference Guide

EtherHub-16mi+

Intelligent Stackable Multi-segment Ethernet Hub
with 16 10BASE-T (RJ-45) ports, 1 10BASE2 (BNC) port,
and SNMP agent



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Introduction

The master hub (and connected stack) can be managed through a PC or modem connection to the hub's serial port, or with SNMP-based network management software such as AccView/Open. Using the configuration program, you can perform the following tasks:

- Enable/disable any port
- Assign backup ports
- Set threshold values
- Configure SNMP parameters
- Display system information or statistics
- Download system firmware
- Restart the system

Making the Connections Required for System Configuration

The diskette included with the EtherHub-16mi+ contains a menu-driven configuration program. To use this program, make a direct PC or modem connection to the serial port on the master hub in the stack.

This section describes how to access the menu-driven configuration program via:

- **Onsite connection**
  A workstation connected to the serial port on the hub.
- **Modem connection**
  A workstation connected to the serial port of a remote hub via modems.
- **In-band connection**
  It also describes how to access the embedded SNMP agent over the network using AccView/Open or other third-party network management software.

Onsite Connection

Attach a PC to the serial port on the master hub. Use the null-modem cable (and DB9 / RJ-45 converters) provided with this package, or use a null modem connection that complies with the wiring assignments shown in the back of this guide.

Modem Connection

Configure the Hub Site: Connect the master hub's DB9 serial port to the modem's serial port using standard cabling. For most modems, which use a 25-pin port, you will have to provide an RS232 cable with a 9-pin connector on one end and a 25-pin connection on the other end. You do not have to set the modem at the hub's site, because the hub will automatically configure it to auto-answer mode.

Configure the Remote Site: At the remote site, connect the PC's COM port (COM 1~4) to the modem's serial port.

In-Band Network Connection

The EtherHub 1500 sytem can also be managed from a computer using network management software such as AccView/Open. However, prior to accessing the hub, you must first configure it with a valid IP address, subnet mask, and default gateway using an out-of-band connection.

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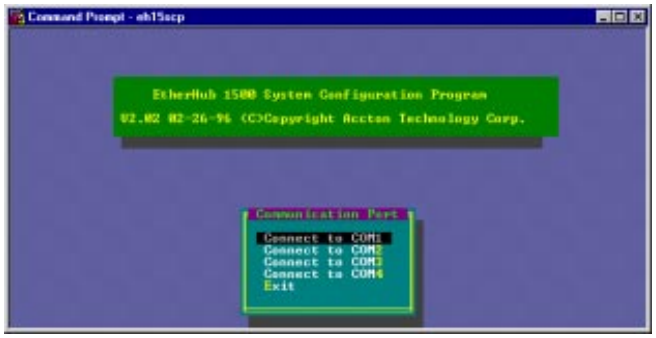
Note: The on-board program only provides access to basic configuration functions. To access the full range of SNMP mangement functions, you must use SNMP-based network mangement software. Accton provides Windows-based SNMP software called AccView/Open with this package. Note that AccView/Open's Hub Manager module can be easily integrated into most third-party management platforms.

Starting the Configuration Program

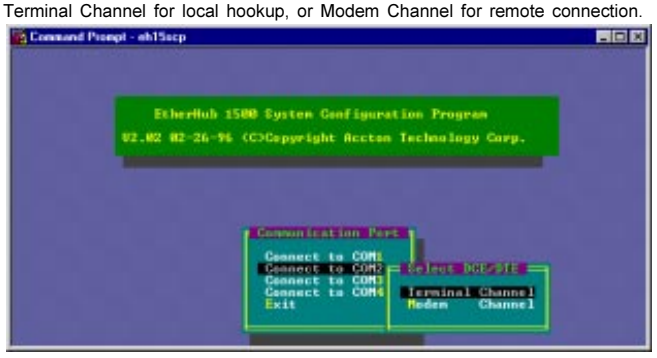
Insert the distribution diskette provided with your EtherHub-16mi+ into the PC's floppy drive.Then activate the EtherHub 1500 System Configuration Program as described below.

Note:
1. When using a PCMCIA modem connection, add the following entry to your config.sys file: "device=cardtalk.sys /A /Com3IRQ=4". If your PC has a PCMCIA modem or multi-I/O card, set the proper IRQ by typing "EH15SCP/i [irq #]".
2. Help is available by entering "EH15SCP/?".
3. This program can only run under DOS, or in Windows DOS shell.

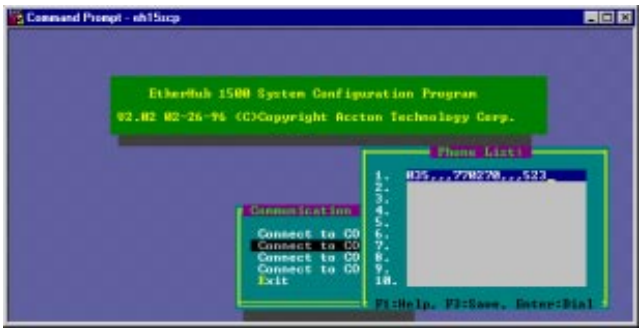
1. Type "EH15SCP" at the DOS prompt C:\>EH15SCP. Using arrow keys, select the communication port on the workstation that is connected to the hub.



2. Select the appropriate option from the DCE/DTE dialog box:
   Terminal Channel for local hookup, or Modem Channel for remote connection.



3. If setting up a remote connection via modems:
   Select Modem Channel to open the Phone List menu as shown below, and enter the phone number and press [Enter] to start the dialing mechanism.



Once the connection is established, the main menu for out-of-band configuration appears as shown below.

Using Configuration Program

The EtherHub 1500 System Configuration Program allows you to define system parameters, manage and control stacked hubs and associated ports, set threshold levels, and monitor network conditions. The following table briefly describes the menu selections available for this program.

Menu	Description	
System	Information -	Defines description for the system.
	Configuration -	Sets system parameters.
	Trap Managers -	Configures Communities, IP and IPX trap managers.
	Download -	Downloads new version of firmware to update your system.
	Restart -	Restarts your system.
	Factory Setting -	Reverts all configuration selections to factory default settings.
	Save Configuration -	Saves the configuration changes made during the current session.
	Reset Configuration -	Restore the last saved configuration.
Control	Hub -	Isolates/attaches a hub, or sets the hub's segment..
	Port -	Disables/enables a port..
	Backup port -	Sets up to 3 pairs of backup ports. Each pair contains a master and slave port. The slave port is normally disabled. When the master port fails, the system disables the master port and enables the slave port to maintain the link.
	Push button -	Enables/disables Configure button to prevent unauthorized use.
Performance	Provides 4 sub-menus - System, Segment, Hub and Port. This selection allows you to view network performance for the selected component. Performance is measured in terms of frames received, number of bytes, collision rate, CRC errors, alignment errors, and total errors.	

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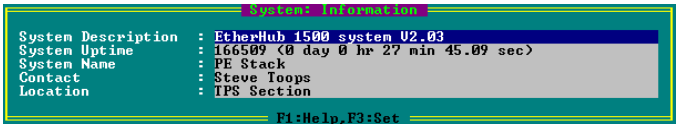
Menu	Description (continued)
Threshold	Provides 5 sub-menus - System, Any Hub, Any Port, Select Hub and Select Port. This menu allows you to set threshold levels for the hub or port in terms of frames received, number of bytes, collisions, CRC errors, alignment errors and total errors.

System Menu

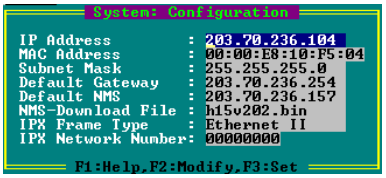
Menu	Description
Information	Displays EtherHub system information.
Configuration	Modifies various parameter settings necessary for communicating with the management agent.
Trap Managers	Selects management stations to receive trap messages from the system.
Download	Downloads a binary file to the SNMP agent.
Restart	Resets the SNMP agent.
Factory Settings	Reverts all configuration settings to the original factory settings.
Save Configuration	Saves the configuration changes made during the current session.
Reset Configuration	Restores the last saved configuration.

Displaying System Information - Use the Information command to display and modify system information about the EtherHub stack, or for quick system identification. View a description of the system, including:


System: Information
System Description : EtherHub 1500 system V2.03
System Uptime : 166509 (0 day 0 hr 27 min 45.09 sec)
System Name : PE Stack
Contact : Steve Toops
Location : IPS Section
F1:Help,F3:Set

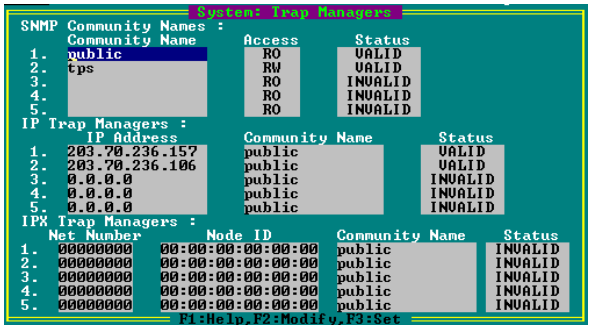
Field	Description
System Description	Name and version of the EtherHub-16mi+ software.
System Uptime	Length of time the EtherHub management agent has been running.
System Name	Name assigned to the EtherHub system.
Contact	Contact person for the system.
Location	Specifies the area or location where the system resides.

Changing System Configuration - Use the Configuration command from the System Menu to modify current values for the following parameters:



Field	Description
IP Address	IP address of the agent you're managing. The EtherHub system may be run on SNMP protocol over UDP/IP transport protocol. In this environment, all systems on the Internet, such as network interconnection devices and Network Management Stations (e.g., the PC running AccView) are assigned an IP address.
MAC Address	Hardware address of EtherHub-16mi+.
Subnet Mask	Subnet mask of the agent you've selected. This mask identifies the host address bits used for routing to specific subnets.
Default Gateway	Default gateway used in passing trap messages from the EtherHub agent to the management station.
Default NMS	For internal use only.
NMS-Download File	For internal use only.
IPX Frame Type	The selected format used on the LAN; i.e., type used by the IPX network where the EtherHub-16mi+ is installed. If the specified frame type is not detected, the EtherHub-16mi+ will automatically detect the current type. (Values: 802.3, Ethernet II, SNAP, 802.2)
IPX Network Number	Identifies the IPX network number for the connected slot. You can disable IPX protocol by setting this number to zero.

Assigning Trap Managers - Use the Trap Managers command from the System Menu to modify current values for the following parameters:


System: Trap Managers
SNMP Community Names :
Community Name Access Status
1. public RO VALID
2. tps RW VALID
3. RO INVALID
4. RO INVALID
5. RO INVALID
IP Trap Managers :
IP Address Community Name Status
1. 203.70.236.157 public VALID
2. 203.70.236.106 public VALID
3. 0.0.0.0 public INVALID
4. 0.0.0.0 public INVALID
5. 0.0.0.0 public INVALID
IPX Trap Managers :
Net Number Node ID Community Name Status
1. 00000000 00:00:00:00:00:00 public INVALID
2. 00000000 00:00:00:00:00:00 public INVALID
3. 00000000 00:00:00:00:00:00 public INVALID
4. 00000000 00:00:00:00:00:00 public INVALID
5. 00000000 00:00:00:00:00:00 public INVALID
F1:Help,F2:Modify,F3:Set

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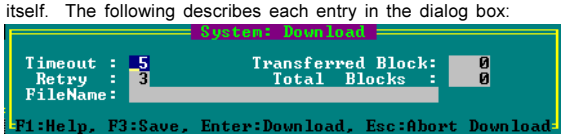
Field	Description
SNMP Community Names	The community strings authorized for trap management access. All community strings used for IP and IPX Trap Managers must be listed in this table.
Community Name	A community entry authorized for trap management access.
Access	Management access is restricted to read-only (RO) or read/write (RW).
Status	The status of the current entry can be set to VALID or INVALID.
IP Trap Managers	IP management stations selected to receive trap messages from the system.
IP Address	IP address of the management station.
Community Name	The community string required for trap management access.
Status	The status of the current entry can be set to VALID or INVALID.
IPX Trap Managers	IPX management stations selected to receive trap messages from the system.
Net Number	Identifies the IPX network number for the connected slot.
Node ID	MAC address of the authorized trap manager.
Community Name	The community string required for trap management access.
Status	The status of the current entry can be set to VALID or INVALID.

Downloading System Software - Use the Download command from the System Menu to load available software updates into the agent's flash ROM. The download file should be an EtherHub binary file from Accton Technology Corporation; otherwise the agent will not accept it.

Invoking this command brings up the Download dialog box. When all entries are confirmed, the display will change to show the progress of the download process. After downloading the new software, the agent will automatically restart itself. The following describes each entry in the dialog box:



Field	Description
Timeout	Time to wait for a response.
Retry	Number of attempts to make contact.
Filename	The binary file to download.
Transferred Block	Current number of data block being transferred.
Total Blocks	Total number of blocks to transfer.

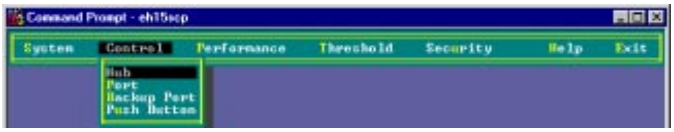
Restarting the Agent - Use the Restart command from the System menu to reset a selected agent. LEDs on the agent will light up sequentially as it executes the initialization test.

Reverting Configuration to Factory Settings - Use the Factory Settings command from the System menu to change all configuration settings back to the factory defaults.

Save Configuration - Saves configuration settings made during current session.

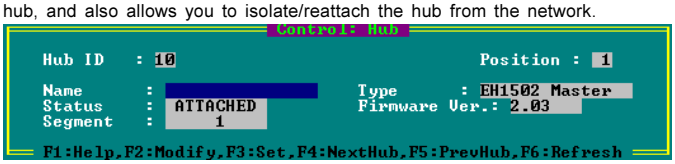
Reset Configuration - Restores configuration settings saved the last time.

Control Menu



Menu	Description
Hub	Includes hub description and commands to isolate/reattach network connection, or assign hub to a specified segment.
Port	Includes port description and command to enable/disable selected port.
Backup Port	Defines master/slave port pairs used for emergency backup.
Push Button	Enables/disables external Configure button on selected hub.

Configuring Hub Parameters - Use the Hub command from the Control menu to configure any hub in the stack. (Select the required hub using the <F4> and <F5> function keys.) This menu provides a brief description of the selected hub, and also allows you to isolate/reattach the hub from the network.



Field	Description
Hub ID	Hub identifier within the stack. (Up to 10 hubs may be connected via the management channel.) Note that hub IDs can only be assigned using the Configure button as described in the Quick Installation Guide.
Position	The physical position in the stack.
Name	Any user-defined name for the selected hub.
Status	The stack connection may be set to ISOLATED or ATTACHED. Note that the Isolated LED will be lit if the hub is isolated. (Although the status of OTHER is provided, this is for internal use only.)
Segment	Attach the hub to a specified segment. The appropriate Segment icon will light up to show that the hub has been connected.
Type	Indicates hub type as EH1501S, or EH1502S (Master or Slave).
Firmware Ver.	Indicates the current firmware version number.

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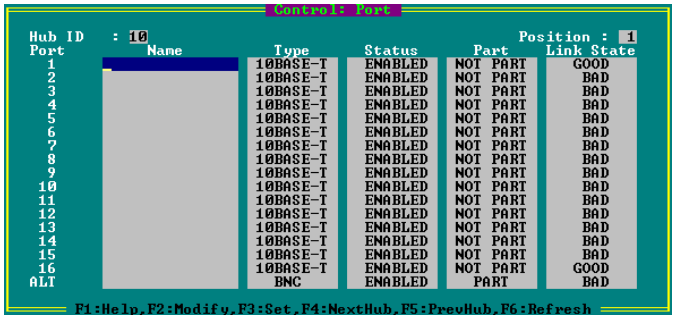
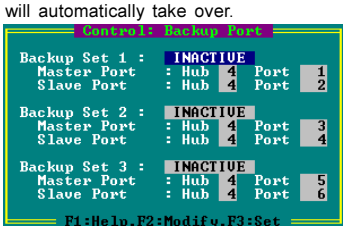
Configuring Port Parameters - Use the Port command from the Control menu to configure the ports for any hub in the stack. (Select the required hub using the <F4> and <F5> function keys.) This menu provides a brief description of the selected hub, and also allows you to enable/disable any port in the selected hub.


Control: Port
Hub ID : 10
Position : 1
Port Name Type Status Part Link State
1 10BASE-T ENABLED NOT PART GOOD
2 10BASE-T ENABLED NOT PART BAD
3 10BASE-T ENABLED NOT PART BAD
4 10BASE-T ENABLED NOT PART BAD
5 10BASE-T ENABLED NOT PART BAD
6 10BASE-T ENABLED NOT PART BAD
7 10BASE-T ENABLED NOT PART BAD
8 10BASE-T ENABLED NOT PART BAD
9 10BASE-T ENABLED NOT PART BAD
10 10BASE-T ENABLED NOT PART BAD
11 10BASE-T ENABLED NOT PART BAD
12 10BASE-T ENABLED NOT PART BAD
13 10BASE-T ENABLED NOT PART BAD
14 10BASE-T ENABLED NOT PART BAD
15 10BASE-T ENABLED NOT PART BAD
16 10BASE-T ENABLED NOT PART GOOD
ALT BNC ENABLED PART BAD
F1:Help,F2:Modify,F3:Set,F4:NextHub,F5:PrevHub,F6:Refresh

Field	Description
Hub ID	Hub identifier within the stack.
Position	The physical position in the stack.
Port *Identifier*	Numeric identifier 1~16 or ALT.
Name	User-defined name for selected port.
Type	Connection types include 10BASE-T (RJ-45), BNC, AUI or FIBER.
Status	Any port may ENABLED or DISABLED.
Part	Indicates if the port is partitioned.
Link State	Indicates if the port has a valid connection to an external device.

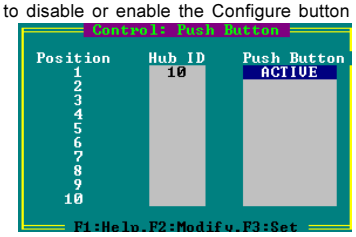
Defining Backup Ports - Use the Backup Port command in the Control Menu to define up to three master/slave port pairs. If the connection to the master port fails, the slave port will automatically take over.


Control: Backup Port
Backup Set 1 : INACTIVE
Master Port : Hub 4 Port 1
Slave Port : Hub 4 Port 2
Backup Set 2 : INACTIVE
Master Port : Hub 4 Port 3
Slave Port : Hub 4 Port 4
Backup Set 3 : INACTIVE
Master Port : Hub 4 Port 5
Slave Port : Hub 4 Port 6
F1:Help,F2:Modify,F3:Set

Field	Description
Backup Set	Defines up to three backup port pairs; each of which can be set to ACTIVE or INACTIVE.
Master Port	Pair member serving as the primary link.
Hub	Hub ID for the master port.
Port	Port identifier for the master port.

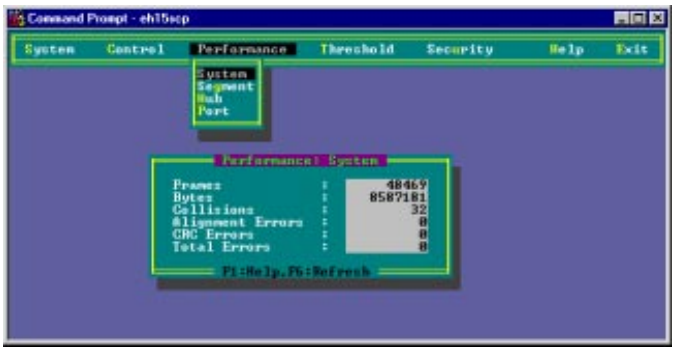
Field	Description (continued)
Slave Port	Pair member serving as the backup link.
Hub	Hub ID for the slave port.
Port	Port identifier for the slave port.

Setting the External Configure Buttons - Use the Push Button command in the Control Menu to disable or enable the Configure button on any hub.



Performance Menu

Displays statistics for the System (entire stack), selected Segment, selected Hub, or all Ports on a specified hub. (Select any segment or hub using the <F4> and <F5> function keys.)



Menu	Description
Frames	Number of frames passing through this device.
Bytes	Number of bytes passing through this device.
Collisions	Number of simultaneous node transmissions detected by this device.
Allignment Errors	Number of mis-synchronized data packets detected by this device.
CRC Errors	Number of Ethernet Cyclic Redundancy Check errors detected by this device.
Total Errors	Total number of errors, including FCS, allignment, Frames Too Long, Short Events, Late Events, Jabber, and Data Rate Mismatches detected on this device.

1: The values displayed have been accumulated since the last system reboot or counter reset.

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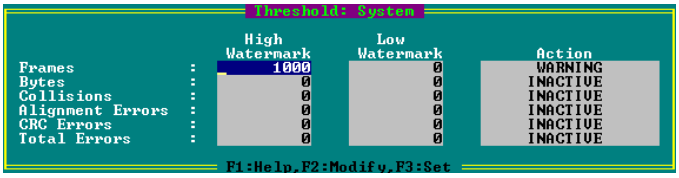
Threshold Menu

Select the Threshold command from the menu bar to define limits for the parameters monitored by the hub system. Limits can be set for the System (entire stack), Any Hub or Any Port, or a Select Hub or Select Port. Variables to monitor include frames, bytes, collisions, frame allignment errors, CRC errors or total errors. High and low watermarks may be set. While the trigger action includes warning, warning and isolate (for hubs), or warning and disable (for ports). When any threshold is exceeded, the agent will issue an alarm to the network management station based on the selected action.

To set thresholds:

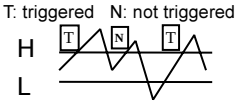
1. Open the Threshold dialog box from the menu bar.
2. Select the system component (Type: System, Any Hub, Any Port, Select Hub, Select Port). If you choose Select Hub or Select Port, then choose the Hub ID or Port ID using the <F2> function key.
3. Select the variable to monitor (Variable: Frames, Bytes, Collisions, Allignments, CRCs or Total Errors). If you choose Select Hub or Select Port, then choose the variable Type using the <F2> function key.
4. Input an integer value for the low and high watermarks.
5. Select the appropriate action (Action: INACTIVE, WARNING, WARNING & ISOLATE for hubs, or WARNING & DISABLE for ports).
6. Implement your settings by pressing the <F3> function key.

Threshold Parameters - Hub/Port parameters include the following items:



Parameter	Description
Frame	The total number of frames.
Bytes	The total number of bytes.
Collisions	Multiple packets transmitted over a medium at the same time, making them unintelligible.
Alignments	Frame alignment errors occur when the received frame is a multiple of 8 bits.
CRCs	This error occurs when the cyclic redundancy check for a frame is wrong. (The cyclic redundancy check an error-checking algorithm used to indicate frame reception errors.)
Total Errors	The total number of collisions, frame alignment errors and CRC errors.

Event Activation - After initial event activation (crossing the high watermark), the monitored variable must reach the low watermark before another event is activated (again crossing the high watermark).



Notes: 1. The rate for all values is per one second.
2. Threshold entries are stored in the agent.

Troubleshooting

Refer to the Quick Installation Guide for a more detailed listing of troubleshooting procedures. However, if you have trouble making a connection via SNMP network management software, then please refer to the following section.

Network Management Access

You can access the EtherHub-16mi+ from anywhere within the attached network. However, you must first configure it with a valid IP address, subnet mask, and default gateway. If you have trouble establishing a link to the SNMP agent (with network management software such as AccView/Open), check to see if you have a valid network connection. Then verify that you entered the correct IP address from your location. Also, be sure the port through which you are connecting to the hub has not been disabled. (See the Control Menu on page 7.) If it has not been disabled, then check the network cabling that runs between your management site and the stack.

Pin Assignments for Serial Port Connections

DB9 Serial Port Pin Description

The DB9 serial port on the back panel is used to connect the hub to a management device. The configuration program can be accessed from a PC, or from a remote location via a modem connection. You can use the management port to configure port settings (e.g., enabled or disabled), or to update device firmware. The pin assignments used to connect various device types to the hub's management port are provided in the following tables.

DB9 Port Pin Assignments

EIA Circuit	CCITT Signal	Description	Hub's DB9 DTE Pin #	PC DB9 DTE Pin #	Modem DB25 DCE Pin #	Signal Direction DTE-DCE
CF	109	**DCD** (Data Carrier Detected)	1	1	8	<---------
BB	104	**RxD** (Received Data)	2	2	3	<---------
BA	103	**TxD** (Transmitted Data)	3	3	2	--------->
CD	108.2	**DTR** (Data Terminal Ready)	4	4	20	--------->
AB	102	**SG** (Signal Ground)	5	5	7	---------
CC	107	**DSR** (Data Set Ready)	6	6	6	<---------
CA	105	**RTS** (Request-to-Send)	7	7	4	--------->
CB	106	**CTS** (Clear-to-Send)	8	8	5	<---------
CE	125	**RI** (Ring Indicator)	9	9	22	<---------

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DB9 Serial Port to RJ-45 Converter Connector Pin Assignment

Description	RJ-45 Pin Mapping	EH1502S DB9
DTR (Data Terminal Ready)	1	4
RxD (Received Data)	2	2
TxD (Transmitted Data)	3	3
SG (Signal Ground)	4	5
RI (Ring Indicator)	5	9
CTS (Clear-to-Send)	6	8
RTS (Request-to-Send)	7	7
DCD (Data Carrier Detected)	8	1
DSR (Data Set Ready)	NC	6

DB9 PC's COM Port to RJ-45 Converter Connector Pin Assignment

Description	RJ-45 Pin Mapping	EH1502 DB9
DTR (Data Terminal Ready)	1	6
RxD (Received Data)	2	3
TxD (Transmitted Data)	3	2
SG (Signal Ground)	4	5
RI (Ring Indicator)	5	9
CTS (Clear-to-Send)	6	7
RTS (Request-to-Send)	7	8
DCD (Data Carrier Detected)	8	1
DSR (Data Set Ready)	NC	4

DB25 RS232 to RJ-45 Converter Connector Pin Assignment

Description	RJ-45 Pin Mapping	EH1502S DB25
DTR (Data Terminal Ready)	1	20
RxD (Received Data)	2	3
TxD (Transmitted Data)	3	2
SG (Signal Ground)	4	7
RI (Ring Indicator)	5	22
CTS (Clear-to-Send)	6	5
RTS (Request-to-Send)	7	4
DCD (Data Carrier Detected)	8	8
DSR (Data Set Ready)	NC	6

Connection from Hub's 9-Pin Serial Port to PC's 9-Pin COM Port

Hub's 9-Pin Serial Port	CCITT Signal	PC's 9-Pin COM Port
1 DCD	------- DCD --------	1
2 RXD	<----- TXD ---------	3
3 TXD	------- RXD ------>	2
4 DTR	------- DSR ------>	6
5 SGND	------- SGND ------	5
6 DSR	------- DTR --------	4
7 RTS	------- CTS ------>	8
8 CTS	<------ RTS --------	7
9 RI	------- RI ----------	9

Connection from Hub's 9-Pin Serial Port to Modem's 25-Pin DCE Port

Hub's 9-Pin Serial Port	CCITT Signal	Modem's 25-Pin COM Port
1	<------ DCD -------	8
2	<------ RXD -------	3
3	-------- TXD ------>	2
4	-------- DTR ------>	20
5	-------- SGND -----	7
6	<------ DSR -------	6
7	-------- RTS ------>	4
8	<------ CTS -------	5
9	<------ RI -------	22

Connection from Hub's 9-Pin Serial Port to PC's 25-Pin DTE Port

Hub's 9-Pin Serial Port	Null Modem	PC's 25-Pin DTE Port
1 DCD	1 ——— 1	8 DCD
2 RXD	2 ——— 3	3 TXD
3 TXD	3 ——— 2	2 RXD
4 DTR	4 ——— 8	20 DTR
5 SGND	5 ——— 20	7 SGND
6 DSR	6 ——— 7	6 DSR
7 RTS	7 ——— 4	4 RTS
8 CTS	9 ——— 5	5 CTS
9 RI	20 ——— 6	22 RI

Optional Management Software

SW6120: AccView EtherHub Manager for SunNet Manager
SW6121: AccView EtherHub Manager for OpenView/Windows
SW6122: AccView EtherHub Manager for OpenView/Unix
SW6122: AccView EtherHub Manager for NMS
SW6130: Network Mangement Support Modules for NMM
SW7300: EtherHub 1500 Security Module

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